Upload Assignment: Assignment 6.3

ASSIGNMENT INFORMATION

Due Date	Points Possible
Monday, November 8, 2021 11:59 PM	**0.5** View Rubric

NONLINEAR SVM CLASSIFIER

Use an SVM classifier to solve the classification problem of assignment 6.1

A. How to use the svmtrain function:

If you type svmtrain you will see that the option -t 4 exists, which allows the user to compute a kernel matrix and use it as an input instead of introducing the data. We will use this option to precompute the kernel matrix and place it in the position "training_instance_matrix". A similar option is present in Python

B. Work out a Matlab or Python function whose input is the data matrix X and wose output is the matrix of kernel dot products for

1. Linear kernel.
2. Order 3 polynomial kernel.
3. Square exponential (also called Gaussian or Radial Basis Function) kernel with variable parameter σ.

- Construct a training set of 100 samples and train a Support Vector Machine.
- Validate the parameter of the square exponential kernel and C with a validatin set of 110 samples.
- Construct a test set of 1000 samples. Compute the kernel matrix between training and test sets.
- Compute the test error.

Do it for all three kernels.

Provide the following

- A draw of the classification boundary for the best values of validation parameters.
- Comments on the results.